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M E D I C I N E

Common Clinical Data Sources: Insurance Claims and Electronic Health Records

Key Takeaway

- Describe the advantages and disadvantages of insurance claims and electronic health records (EHRs)

Insurance Claims Data

Advantages of insurance claims:

- Covers a broad scope of data across various providers (e.g., Dx and Rx records are often reliable)
- Often has a higher consistency across different claims data sources (e.g., unified forms)
- Large-scale claims datasets that cover large populations are available

Disadvantages of insurance claims:

- Only includes Dx, Rx, and other data listed in the claims (e.g., misses lab values, vital signs, problem list, family history)
- Limited to insured patients
- Non-covered Rx and procedures are missing (e.g., over-the-counter medications)

Insurance Data: Hospitals

- Hospital claims, often referred to as facility claims, can be categorized broadly as inpatient and outpatient:
 - Inpatient claims are generated from an admission to a facility
 - Outpatient facility claims are generated for services, such as emergency room visits, ambulatory surgeries, and other services provided in an institutional setting where there is a facility charge

Insurance Data: Hospitals

- Facility claims are billed using the Uniform Billing (UB) form: UB04
(aka CMS 1450, previously UB92 – National Uniform Billing Committee NUBC)
- Most insurers use the same unified form; however, submissions are increasingly accomplished electronically
(e.g., ANSI ASC X12N 837I standard for Centers for Medicare & Medicaid Services)

Insurance Data: Hospitals



Figure. Adapted from National Uniform Billing Committee Become a subscriber Web page

Insurance Data: Hospitals

UB04	Description
1	Provider Name and Address
2	Pay-To Name and Address
3a	Patient Control Number
3b	Medical Record Number
4	Type of Bill
5	Federal Tax ID Number
6	Statement Cover Period
7	Future Use (and others)
8a	Patient ID
8b	Patient Name
9a-e	Patient Address
10	Patient Birthdate
11	Patient Sex
12-15	Admission Information (Date, Time, Type, and Source)
16-17	Discharge Information

UB04	Description
18-28	Condition Codes
29	Accident State
31-36	Occurrence Codes/Dates
38	Responsible Party
39-41	Code Values and Amounts
42-43	Revenue Code/Description
44	HCCPS/Rate
45	Service Date
46	Unit of Service
47	Total Charges
48	Non-covered Charges
50	Payer ID/Name
51	Health Plan ID
54	Prior Payments
55	Estimated Amount Due

UB04	Description
56-57	Provider NPI
58-62	Insured's Information
63	Treatment Authorization Codes
65	Employer Name
66	Dx/Procedure Code Qual.
67	Principal Dx
69	Admitting Dx Code
70	Patient's Reason Visit Code
71	PPS Code
72	External Cause of Injury
74	Principal Procedure Code
76	Attending Name
77	Operating ID
80	Additional Remarks
81	Code Qualifiers

Select list of available data fields in UB04 (hospital claims)

(note that not all fields are required, and the requirements vary between IP and OP claims)

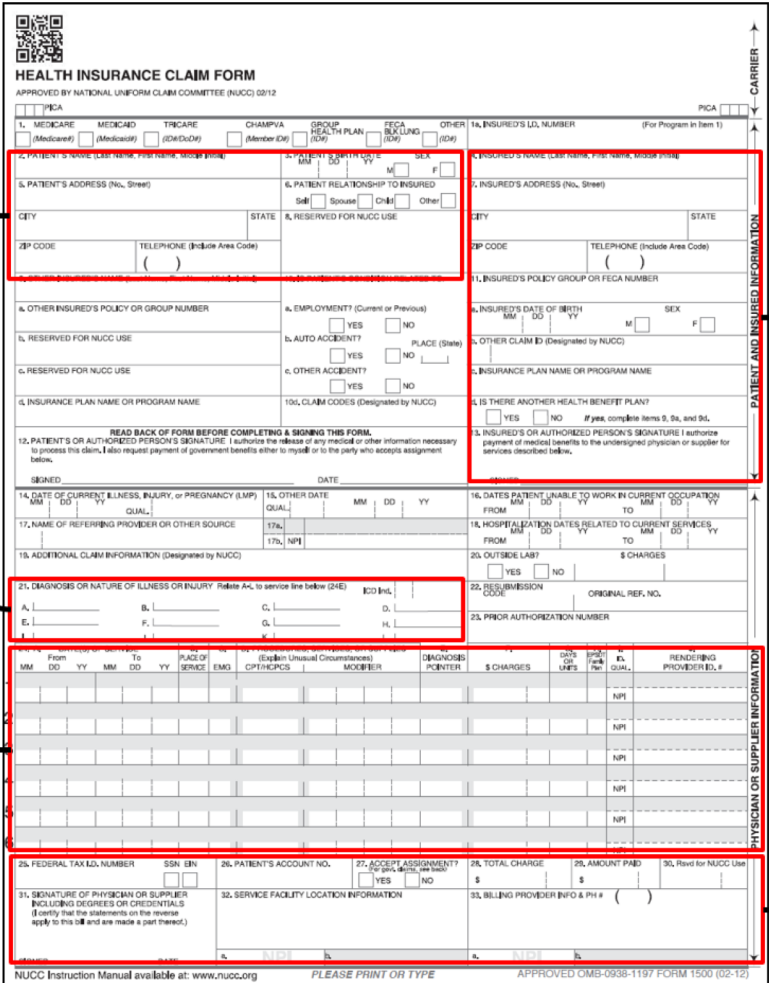
Insurance Data: Physicians

- Physician claims often are classified into a larger category of professional claims, which include other non-physician medical professionals, such as nurse practitioners, respiratory therapists, or physical therapists, regardless of the place of service.
- Professional claims are billed using the CMS 1500 form.

Insurance Data: Physicians

- It is important to note that, with respect to hospital admissions, two claims may be submitted: the facility services (e.g., room and board, ancillary services, in-hospital drugs) and the professional services (e.g., *physicians, surgeons, nurse practitioners*)
- Medicare's CMS 1500 claims are mainly transmitted electronically, which is standardized (*ANSI ASC X12N 837P*)

Insurance Data: Physicians



HEALTH INSURANCE CLAIM FORM
APPROVED BY NATIONAL UNIFORM CLAIM COMMITTEE (NUCC) 02/12

Patient info and demographics (Annotations point to sections 1-10)

Dx codes (Annotation points to section 21)

Procedure codes, Medication codes, and Total charges (Annotation points to section 24)

Payer and Insured's info (Annotation points to sections 11-13)

Provider info (Annotation points to sections 25-33)

NUCC Instruction Manual available at: www.nucc.org PLEASE PRINT OR TYPE APPROVED CMS-1500-1197 FORM 1500 (02-12)

Figure. Adapted from Form CMS 1500.

Insurance Data: Physicians

CMS 1500	Description
1	Type of Health Insurance
2	Patient Name
3	Patient DOB and Sex
4	Insured's Name
5	Patient Contact Info
6	Insured/Patient Relationship
7	Insured's Contact Info
8	Marital Status (retired)
9	Other Insured's Name
10a-d	Patient Condition
11	Insured's Policy Group
12	Patient Signature
13	Insured's Signature
14	Current Illness Date
16	Unable to Work Dates
17	Referring Provider Name/NPI
18	Hospitalization Dates

CMS 1500	Description
20	Outside Lab Charges
21	Patient Diagnoses Codes
23	Quality Improvement Organization Authorization #
24	Procedures/Medications
24e	Diagnosis Code Reference
24f	Charges
24g	Days or Units
24j	Rendering Provider's NPI
25	Provider's SSN/EIN
26	Patient's Account # (Billing)
27	Acceptance of Medicare
28	Total Charges (sum of 24f)
29	Total Paid by Patient
31	Provider's Signature
32	Service Facility Location
33	Billing Provider's NPI/Info

Insurance Data: Pharmacies

- Rx claims are mostly transactional and are relatively straightforward, which results in adjudicating them quickly
- Rx can be claimed through CMS1500 or other private claim forms; however, most of the claims are executed electronically
- Outpatient drugs are assigned a National Drug Code (NDC) identifier (assigned and maintained by the FDA)
- An Rx claim file may also contain some descriptive information related to the drug itself
- Note that medications that are prescribed by a physician but are never filled will not generate claims
- A significant limitation in Rx claims is the absence of a diagnosis on the claim (in contrast to medical claims)

Insurance Data: Pharmacies



aetna	Commercial Prescription Drug Claim Form	Aetna Pharmacy Management PO Box 52444 Phoenix, AZ 85072-2444 FAX: 1-888-472-1128
Aetna Member Number (claim cannot be processed without number) <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		Group Number <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
If you are enrolled in Medicare, check here <input type="checkbox"/> Employee Name (First, Middle, Last) _____		Employee Birthdate (MM/DD/YYYY) _____
Employee Address (Street, City, State, ZIP Code) _____ Company Name & Address (Street, City, State, ZIP Code) _____		
Employee Signature _____	Telephone Number () _____	Date _____/_____/_____
Prescriptions to be for: Last Name, First, Middle initial Gender <input type="checkbox"/> Male <input type="checkbox"/> Female Employee <input type="checkbox"/> Spouse <input type="checkbox"/> Dependent <input type="checkbox"/> Patient Birthdate (MM/DD/YYYY) _____		
Are any family members expenses covered by another group health plan, group pre-payment plan (Plus Cross-Buyer Shield), etc., no fault auto insurance, Medicare, or any federal, state, or local government program? <input type="checkbox"/> No <input type="checkbox"/> Yes		
If yes, list policy or contract holder, policy or contract number(s) and name/address of insurance company or administrator. _____		
If Medicare, check all that apply: <input type="checkbox"/> Medicare Part A <input type="checkbox"/> Medicare Part B <input type="checkbox"/> Medicare Part D		
Member ID Number under Other Plan _____	Member Name _____	Member Birthdate (MM/DD/YYYY) _____
Indicate reason for manually filing these claims: <input type="checkbox"/> Coordination of Benefits - Please attach an Explanation of Benefits from the primary carrier along with the detailed receipt. <input type="checkbox"/> Emergency - If Emergency, describe Emergency below, on or in a separate sheet. <input type="checkbox"/> Compound Drug - If you have a drug that contains more than 1 ingredient. Please provide the following information: The UNAD 11-digit NDC number for EACH ingredient used in this compound prescription. The ingredient name for each NDC. The "metric quantity" expressed in number of tablets, grams or milliliters for each ingredient NDC #. The cost for EACH ingredient (dollar amount). The TOTAL compounded quantity. The TOTAL dollar amount paid by the patient.		
Please Note: Manual submission of claims does not guarantee reimbursement of claim.		
Pharmacy Information Please attach detailed prescription receipts or ask your pharmacist for a pharmacy statement. We cannot process your claim without this information.		
Member <ul style="list-style-type: none"> • Please read carefully before completing this form. Claim forms without the required information cannot be processed. Incomplete forms will be returned to you. • If you use more than one pharmacy, use a separate form for each pharmacy. • Use a separate claim form for each patient. • Claims must be submitted within two years of date of purchase. • Complete all employee and patient information on the top portion of the form and be sure to sign it. • Mail or FAX the Prescription Drug Claim Form to: Aetna Pharmacy Management P.O. Box 52444 Phoenix, AZ 85072-2444 FAX: 1-888-472-1128 	Submission Requirements You MUST include all original "pharmacy" receipts in order to process a claim. Cash register receipts WILL NOT be accepted with the exception of Diabetic Supplies. The minimum information that must be included on your pharmacy receipts is listed below: • Patient Name + Subscription Number + Medicine NDC number • Date of Fill + Metric Quantity + Total Charge • Days Supply for your prescription (you need to ask your pharmacist for the "Days Supply" information) • Pharmacy Name and Address or Pharmacy NABP Number (If the Prescribing Physician's NPI (National Provider Identification) number is from a foreign country, please fill in below: Country: _____ Currency: _____ Amount: _____	

GC-1882 (3-16)

R-P00

Prescription Drug Reimbursement / Coordination of Benefits Claim Form

An incomplete form may delay your reimbursement.
See the back for instructions and complete all information.

>> Cardholder Information See your prescription drug ID card.

Group No. [] [] [] [] [] [] [] [] [] []
Member ID [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []
Member Name First Last
[] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []
Street Address
[] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []
City State ZIP
[] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []

>> Patient Information

Patient Name First Last
[] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []
Patient Date of Birth (Month/Day/Year) []/[]/[] [] [] [] [] [] [] [] []
Sex Relationship to Plan Member
☐ Female ☐ Male ☐ Self ☐ Spouse ☐ Disabled Dependent
☐ 2 Spouse ☐ 4 Dependent Parent
☐ Eligible Child ☐ Non-spouse Partner
☐ 4 Dependent Student ☐ Other

>> Pharmacy Information

Name of Pharmacy
[] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []
Street Address
[] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []
City State ZIP
[] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []
Telephone (include area code) []-[]-[]-[]-[]-[]

Is this an on-site nursing home pharmacy? ☐ Yes ☐ No

I hereby certify that the therapeutic dose for the medication(s) prescribed is current and agree to provide Express Scripts or its agents reasonable access to records related to medication dispensed by this patient as described in applicable law. Further receipt for reimbursement will be paid directly to the plan member and assignment of these benefits to a pharmacy is my own free choice.

X NCPDP Form Request
Signature of Pharmacy or Representative (Required) [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []

>> Acknowledgment

I certify that the medication(s) described was/were received for use by the patient listed above, and that I (or the patient, if not myself) am eligible for prescription drug benefits. I certify that the medication(s) described were not for use as an off-the-job injury. By completing this form, I recognize that reimbursement will be paid directly to me and that assignment of these benefits to a pharmacy is my own free choice.*

X Signature of Member Date _____

*If allowed by law, you may assign the payment of this claim to your pharmacy. If your pharmacy is willing to accept assignment, it does complete this form.
Please contact your pharmacy contact Pharmacy Services at 800-932-1357 for assistance.

>> Claim Receipts
Take receipts or itemized bills on the back.
See back for details.
Check the appropriate box if any receipts or bills are for a:

- ☐ Compound prescription
Make sure your pharmacist lists ALL the NDC/NON-NDC numbers, cost and quantities for each ingredient on the back of this form and attach receipts. Claim will be reformed if inaccurate.
ONE CLAIM FORM PER COMPOUND SUBMISSION
- ☐ Medication purchased outside of the United States
Please indicate:
Country _____
Currency used _____
- ☐ Allergy medication

Coordination of Benefits
(Another Health Plan has paid a portion.) Mark the appropriate box for your primary coverage method. See the back for more information.
This is a coordination of benefits claim?
☐ Yes ☐ No

☐ Another Health Plan paid and you are enclosing a statement that outlines how much you paid and how much the other carrier paid (3)

☐ Card Program (3)

☐ Express Scripts Mail Order (4)

Any person who knowingly and with intent to defraud, ignore, or deceive any insurance company submitting a claim or application containing any material false, deceptive, incomplete, or misleading information pertaining to his claim may be committing a fraudulent insurance act, which is a crime and may subject such person to criminal or civil penalties, including fines and/or imprisonment or loss of benefits.

Please paste receipts on the back of this page.

[illegible]

Image compilation of Aetna Commercial prescription drug claim form, Express Scripts Prescription drug reimbursement/coordination of benefits claim form, and OptumRx Member reimbursement pharmacy form.

Insurance Data: Pharmacies

- Pharmacy Benefit Management (PBM) acts as an intermediary between the payer and everyone else in the health care system (e.g., *Express Scripts, CVS Health, UHC/OptumRx Catamaran, Prime Therapeutics*)
- Other non-claims sources of medication data (mainly contain prescription events and not filled data):
 - EHRs: contain prescription data for a provider's population of patients
 - Surescripts: operates the nation's largest health information (e-prescribing) network
 - Prescription Drug Monitoring Program (PDMP): state-run programs that collect and distribute data about the prescription and dispensation of federally controlled substances and other potentially addictive drugs

Advantages of EHR data:

- Includes unique data types (e.g., lab values, vital signs, social data, problem list)
- Includes procedures and Rx that are not covered by insurance (e.g., over-the-counter medications)
- Includes both insured and uninsured patients.

Disadvantages of EHR data:

- Usually includes data collected by one provider entity and does not include data collected elsewhere (i.e., EHR leakage)
- Often has a lower consistency across different data providers, especially considering the free text
- Large-scale EHR datasets that cover large populations are uncommon

- Meaningful Use and EHR certification criteria have helped to shape minimal required data types collected by EHRs
(e.g., patient demographics, past medical history, problem list, diagnosis, procedures, allergies, medications)
- Variation of data types and data quality of EHR data collected across different providers is still hindering the common use of EHR data for health analytic
- EHR data is usually limited to data collected from patients at a given provider and lacks information collected elsewhere

- Common population-level health data types in EHRs:
 - Demographics
 - Diagnoses and problem lists
 - Procedures
 - Prescriptions (medications)
 - Family and social histories
 - Vital signs
 - Immunization records
 - Surveys and patient-reported outcomes
 - Additional meta-data and free-text notes/reports

Nontraditional Data Sources of Population-Level Health

- Patient-provided/-generated data sources
- Public health and vital records data sources
- Social services data sources
- Environmental and geographical data sources
- Resource availability data sources
- Consumer and nonmedical data sources
- Health information exchange (HIE) data sources
- Other potential data sources.

Summary

- Common Data Sources
 - Insurance Claims
 - Electronic Health Records (EHRs)
- Non-traditional Data Sources